Using Equity Market Reactions to Infer Exposure to Trade Liberalization

Andrew Greenland* Mihai Ion† John Lopresti‡ Peter K. Schott§

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Abstract

We propose using average abnormal equity returns (AAR) to identify firm sensitivity to changes in trade policy. This approach captures the net impact of all avenues of exposure and yields estimates for both goods-producing and service firms, provided they are publicly traded. Applying our method to an important US trade liberalization towards China, we find that higher AARs predict relative increases in employment, sales and capital stocks, that AARs provide explanatory power beyond the standard measure of exposure used to study this liberalization, and that they highlight variation in outcomes across firms even within narrowly defined industries.

*Martha and Spencer Love School of Business, Elon University; agreenland@elon.edu
†Eller College of Management, University of Arizona; mihaiion@email.arizona.edu
‡The College of William & Mary; jwlopresti@wm.edu
§Yale School of Management & NBER; peter.schott@yale.edu

1 Introduction

A large and expanding literature documents the distributional implications of trade liberalization (Topalova (2010); Autor et al. (2014); Dix-Carneiro (2014); Hakobyan and McLaren (2016)). In most of this research, exposure to changes in trade policy is defined in terms of import competition, measured via changes in tariffs or import volumes among the set of goods a worker, firm or region produces. This standard approach has two disadvantages. First, by concentrating on import competition, it may ignore other, potentially offsetting avenues of exposure. For example, trade liberalization may allow some firms within an industry subject to the same level of import competition to expand by taking greater advantage of low-cost foreign inputs, either via arm's-length transactions or by offshoring (Antràs et al. (2017); Bernard et al. (2018)). Second, because changes in trade barriers and import volumes are not easily observed for service firms, the standard approach often ignores firms outside goods-producing industries, which account for the vast majority of employment in developed countries. These firms may be exposed to the change in policy through various channels, including via their downstream customer base, upstream suppliers or local labor markets.

In this paper we propose an alternative method for measuring firms' sensitivity to trade liberalization. Our approach is based on financial markets' reactions to key legislative events associated with the change in policy, and assumes that all new information about the liberalization that is relevant for firm value is fully reflected in its stock price. Hence, by measuring firms' average abnormal returns (AAR) relative to the market during these events, we can obtain traders' overall assessment of the policy change's effect on firm value. This approach addresses both of the limitations noted above: it captures the expected *net* impact of all forms of exposure, and it yields estimates for firms in all sectors of the economy, provided they are publicly traded.

We apply our method to a much-studied event in the international trade literature, the US granting of permanent normal trade relations (PNTR) to China in October, 2000. PNTR was a non-traditional trade liberalization in that it substantially reduced expected rather than actually applied US import tariffs on many Chinese goods.[1] We focus on firms' equity returns across the two days before and after five legislative milestones: the introduction of the bill for PNTR in the House, the House vote for PNTR, the Senate vote to invoke cloture to proceed to a vote on PNTR, the Senate vote for PNTR, and Clinton's signing of PNTR into law. For

[1] We describe this change in policy in more detail in Section 2. Pierce and Schott (2016a) show that US industries with greater exposure to PNTR exhibit relative reductions in manufacturing employment and manufacturing establishments, and relative increases in US firms importing from China and Chinese firms exporting to the United States. Handley and Limão (2017) estimate that the reduction in trade policy uncertainty associated with PNTR is equivalent to a reduction in tariff rates of approximately 13 percent. Related research by Autor et al. (2013) and Autor et al. (2014) finds that regions more exposed to Chinese import competition during this period experience relative declines in employment and increase in the uptake of social welfare programs, and that workers more exposed to Chinese imports exhibit relative declines in earnings.

goods-producing firms, we find that average abnormal returns across these five events are correlated with the standard measure of exposure to PNTR used in the literature, known as the NTR gap. Further support for our approach comes from comparing PNTR *AAR*s to abnormal returns estimated across two other prominent events in US-China relations: the accidental NATO bombing of the Chinese embassy in Belgrade in 1999, and Donald Trump's election to President in 2016. We find negative relationships in both cases, consistent with these events' potential negative implications for US-China trade.[2] Importantly, we find that both of these relationships also hold among service firms, for which direct measures of exposure to the change in policy are unavailable.

Having established that PNTR *AAR*s are related to the expected tariff reductions mandated by the change in policy among goods producers, we employ a generalized difference-in-differences specification to investigate their relative explanatory power with respect to various firm outcomes studied in the literature. Our estimates imply that a one standard deviation increase in *AAR*s is associated with relative increases of 12, 17 and 14 percent in firms' employment, sales and capital stocks, and commensurate relative decreases in the probability of firm exit. Lending further support for our approach, we find that these relationships persist even after controlling for the NTR gap, indicating that average abnormal returns capture information beyond that associated with the standard measure of import competition in this setting. Finally, highlighting a key advantage of our approach, we find that firms in service industries exhibit relative changes in outcomes that are of similar in magnitude to those observed among goods producers.

Beginning with Fama et al. (1969), event studies have been used extensively in corporate finance to estimate the effect of new information on firm value.[3] While this approach is not widely used in international economics, we are not the first to examine the relationship between stock returns and trade liberalization. For example: Mosder and Rose (2014) use equity market reactions to document that regional trade agreements are received more positively the greater the extent of pre-existing trade with the proposed partners; Breinlich (2011) shows that as passage of the Canada-US Free Trade Agreement became more likely, Canadian exporters experienced equity-market gains relative to non-exporters; and, most recently, Huang et al. (2018) find a negative relationship between firms' abnormal returns following President Trump's March 22, 2018 memorandum signifying a potential "trade war" between the US and China and firms' sales to China.

In contrast to this research, we use average abnormal stock returns to measure exposure to trade liberalization, and show that this measure can be used to predict subsequent changes

[2] Wagner et al. (2018) find that foreign-oriented firms' equity fare worse than domestically-oriented firms' following Trump's election. As discussed further in Section 3, we do not explore this relationship at the firm level given firm attrition between 2000 and 2016.

[3] Khotari and Warner (2006) document that this approach has been used in over 565 articles appearing in the top finance journals through 2006. For a recent critique of this literature, see Wolfers and Zitzewitz (2018).

in firm outcomes. In this respect, our aim is similar to that of prior research seeking to identify the multiple channels by which firms might be exposed to globalization. A number of papers, for example, examine the impact of trade liberalization on downstream firms' intermediate inputs costs' and productivity (Amiti and Konings (2007); Fernandes (2007); Golberg et al. (2010); Topalova and Khandelwal (2011)), while others emphasize its effect on investment, product scope and innovation (Bernard et al. (2006); Bustos (2011); Bloom et al. (2016); Pierce and Schott (2017); Autor et al. (2017); Gutierrez and Phillipon (2017)) or the transmission of labor demand shocks through supply chains and exports (Acemoglu et al. (2016); Feenstra et al. (2017); Feenstra and Sasahara (2017); Wang et al. (2018)). A virtue of our approach is that it identifies the *net* impact of all of these forces without requiring any information about firms' actual supply chains, innovative activity or labor market relationships.[4]

The paper proceeds as follows. In Section 2 we discuss the details of the event study and describe our estimates. Section 3 relates our estimates to existing measures of Chinese import competition as well as the equity market response to the 2016 Presidential Election. Sections 4 and 5 examine the relationship between firms' average annual returns and firm outcomes, and compare the relative explanatory power of the standard measure of import competition used to evaluate PNTR. Section 6 concludes.

2 Estimating the Expected Impact of PNTR

Assuming markets are efficient, a firm's stock price reflects all available information about its future profitability. Thus, news that shifts expectations about future profit streams causes a re-valuation of the firm, with positive news raising value and negative news lowering it.[5] In this section we outline how we use an event study framework to measure firms' exposure to the US granting of permanent normal trade relations (PNTR) to China.

2.1 A Brief Overview of PNTR

Broadly speaking, the United States has two sets of tariff rates. The first set, known as "normal trade relations" or NTR tariffs, are generally low and are applied to goods imported from other members of the World Trade Organization (WTO). The second set, known as non-NTR tariffs, were set by the Smoot-Hawley Tariff Act of 1930 and are often substantially higher than NTR rates. While imports from non-market economies such as China are by

[4]Beyond the international trade literature, our approach is most similar to to Mobarak and Purbasari (2006) and Kogan et al. (2017), who use equity event studies to identify politically connected firms in Indonesia and the value of new patents among innovating firms, respectively.

[5]As the stock price is the net present value of the cash flows of the firm, changes in expected profits may reflect either changes in the expected cash flows or the rate at which they are discounted.

default subject to the higher non-NTR rates, US law allows the President to grant such countries access to NTR rates on a year-by-year basis, subject to potential overrule by Congress.

US Presidents began requesting that China be granted such a waiver in 1980. Congressional approval of these requests were uncontroversial until the Chinese government's crackdown on Tiananmen Square protests in 1989, after which it became politically contentious and less certain. This uncertainty reduced US firms' incentives to invest in closer economic relations with China, and *vice versa*.[6] It ended with Congress' passage of a bill HR 4444 granting China permanent normal trade relations (PNTR) status in October, 2000, which formally took effect upon China's entry into the WTO in December, 2001.

2.2 Using Event Studies to Estimate Firm Exposure to PNTR

Our event study focuses on five legislative hurdles required for PNTR's passage: (1) the May 15, 2000 introduction of the bill in the US House of Representatives; (2) the May 24, 2000 vote to approve China's PNTR status by the US House of Representatives; (3) the successful July 27, 2000 cloture motion to proceed with a vote on PNTR; (4) the September 19, 2000 vote to approve China's PNTR status by the US Senate; and (5) the October 10, 2000 signature of PNTR into law by President Clinton.[7] We assume that these are the key events during which the substantial reduction in tariff rate uncertainty associated with PNTR discussed in Pierce and Schott (2016a) and Handley and Limão (2017) was incorporated into firms' stock prices.

Estimation of abnormal returns requires taking a stand about the period of time during which information is absorbed into stock prices. Windows that are too wide risk incorporating price changes associated with confounding events, while intervals that are too narrow may miss changes in value that leak out slowly over time. Here, given that PNTR's attributes and the schedule of its associated votes were well known, we use relatively short windows – the two trading days preceding and following the day of the vote – designed to capture the information revealed by their success or failure.

Partial support for this window is provided by Figure 1, which plots the number of new articles appearing in major news outlets that contain the three phrases "Permanent Normal Trade Relations," "China" and "United States" during calendar year 2000, highlighting the two trading days before and two trading days after each of the five events noted above.[8] As

[6] As noted in Pierce and Schott (2016a), for example, a representative from Mattel testifying before the House Ways and Means Committee asserted that "[w]hile the risk that the United States would withdraw NTR status from China may be small, if it did occur the consequences would be catastrophic for US toy companies given the 70 percent non-MFN US rate of duty applicable to toys." (St. Maxens 2000, p. 185).

[7] For the full list of actions related to PNTR passage, see https://www.congress.gov/bill/106th-congress/house-bill/4444/actions.

[8] The news outlets are: Associated Press, BBC Monitoring International Reports, The Boston Globe, The

indicated in the figure, the number of articles mentioning PNTR jumps substantially during the event windows surrounding the introduction of the bill into the House as well as the votes in both the House and Senate. The number rises modestly during the event windows surrounding the cloture vote in the Senate and the Clinton signing.[9]

We isolate the impact of PNTR on firm value by computing a firm's average "abnormal" return over each event window, i.e., the difference between the average actual (or "realized") return and an estimate of the average "normal" return that would have prevailed during the window absent any news of PNTR. We derive estimates of firms normal returns from the Capital Asset Pricing Model (CAPM) developed by Sharpe (1964), which relates firm j's realized return between trading days $t-1$ and t (R_{jt})[10] to the risk-free return (R_{ft}) and the firm's exposure to systematic risk. The model predicts that that the market portfolio captures all sources of systematic risk. Hence, a regression of firm-level excess daily returns $(R_{jt}-R_{ft})$ on market excess returns $(R_{mt}-R_{ft})$ should yield the firm's exposure to systematic risk (β_j),

$$R_{jt} - R_{ft} = \beta_j(R_{mt} - R_{ft}) + \epsilon_{jt}. \tag{1}$$

We recover each firm's estimated $\hat{\beta}_j$ by running a separate regression for each firm over all trading days in 1999.[11] We choose this period to assure that our estimations of $\hat{\beta}_j$ do not occur during the period when relevant legislative information about PNTR became known.[12] We run these regressions for all publicly-traded firms incorporated in the United States that trade on one of the three main stock exchanges (NYSE, AMEX and NASDAQ) and are present for at least 120 days of the 250-day estimation period. Data on firms' daily returns are provided by the Center for Research in Security Prices (CRSP), while the daily market return and risk-free rate are taken from Kenneth French's website.[13]

The average abnormal return for firm j over event window e, AAR_j^e, is then calculated as

Chicago Tribune, CNN Transcripts, The Financial Times, The Los Angeles Times, The New York Times, The Washington Post, PR Newswire, and The Wall Street Journal.

[9] We caution that the magnitudes of the peaks in Figure 1 do not necessarily reflect the relative importance of each event. For example, while PNTR received considerably less discussion surrounding the Clinton signing, this was the event in which any remaining uncertainty regarding the policy's implementation was resolved. Note that the substantial gap between the cloture vote in the Senate and the vote on PNTR corresponds to an August recess.

[10] The firm's daily return is simply the percent change in its market value from time t-1 to t.

[11] We note that equation 1 also imposes an intercept of zero for all firms, i.e., $\alpha_j = 0$. Were this not the case, firms' expected returns would include a persistent component unrelated to market risk, in violation of our maintained assumption of market efficiency. That is, if markets are efficient, any such persistent firm-specific return is arbitraged away.

[12] Results are qualitatively and quantitatively similar utilizing βs that are estimated separately using the 250 days that end 30 days before each event.

[13] See http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/f-f_factors.html. Note that R_{ft} is the one-month Treasury bill rate and R_{mt} is the daily value-weighted return on the portfolio of all firms on the NYSE, AMEX and NASDAQ.

the average of abnormal return during the five-trading-day window[14] centered on the event date, t_0,

$$AAR_j^e = (\sum_{t=t_0-2}^{t_0+2} R_{jt} - \hat{\beta}_j R_{mt})/5. \tag{2}$$

For most of our analysis, we use the average abnormal return across all five events,

$$\begin{aligned} AAR_j^{PNTR} = (&AAR_j^{HouseIntro} + AAR_j^{HouseVote} + AAR_j^{SenateCloture} \\ &+ AAR_j^{SenateVote} + AAR_j^{Clinton})/5. \end{aligned} \tag{3}$$

Multiplying AAR_j^{PNTR} by 25, therefore, yields the cumulative average abnormal return across the 25 days captured by the 5 events. This procedure yields an AAR_j^{PNTR} for the 5,353 firms that are present during at least one of the five events (as well as the pre-period used to estimate $\hat{\beta}_j$).[15] We refer to AAR_j^{PNTR} as firm j's PNTR average abnormal return, and note that insofar as market returns incorporate some element of exposure to international trade policy, a given firm's AAR_j^{PNTR} captures that firm's deviation from that market component. Thus, relating AAR_j^{PNTR} to firm outcomes provides an estimate of the relative effects of exposure to the change in policy, compared to the market. The three panels of Figure 2 compare the distributions of AAR_j^e for each of the five legislative events, as well as the distribution of the overall average abnormal returns, AAR_j^{PNTR}. As indicated in the figure, there is substantial heterogeneity in firm responses in each case.[16]

Using data from COMPUSTAT, we classify firms into three mutually exclusive categories – goods-producing, non-goods producing and diversified – depending on the mix of 6-digit NAICS codes spanned by their major business segments.[17] As illustrated in Figure 3, we find that the AAR_i^{PNTR} of goods-producing firms is more left-skewed than non-goods-producing (hereafter "service") firms, and that the distribution of diversified firms lies between the

[14] We choose a relatively narrow, 5 day window around each event to minimize the influence of alternate factors on firms' returns. Such windows are particularly appropriate if the market can be presumed to understand the implications of the information revealed, but the timing and outcome of the event itself is unknown. In this case, for example,while the details HR4444 were well known, whether the bill would be scheduled for a vote, and what the outcome of the vote would be, were unknown.

[15] If a firm is missing from an event, its abnormal returns represent the average over events for which it is present.

[16] The AAR_j^e associated with the five events have means and standard deviations as follows (in chronological order, and all in percentage terms). Means: 0.1, -0.6, -0.2, -0.4, -0.6, and -0.3. Standard deviations: 1.8, 2.0, 2.0, 1.8, and 2.2.

[17] COMPUSTAT reports firms' sales in up to ten business segments. We define goods-producing sectors as Manufacturing (NAICS 31-33), Mining (NAICS 21), and Agriculture, Forestry, Fishing and Hunting (NAICS 11). Our sample consists of 2078 goods firms, 2544 service firms and 623 diversified firms. Information on business segments is missing for 48 firms, which are treated as diversified here and for the remainder of the analysis.

distributions of these two groups of firms. The means, standard deviations and inter-quartile ranges for the three groups of firms are -0.48, 1.05 and 1.24 percent, -0.28, 1.00 and 0.85 percent, and -0.31, 1.02 and 1.12 percent, respectively.

Finally, we highlight variation of firm abnormal returns within industries in Figure 4, which compares AAR_j^{PNTR} to AAR_i^{PNTR}, the market capitalization-weighted average abnormal return of all firms whose largest segment is 6-digit NAICS industry i. Results for goods-producing firms are in the left panel, while results for non-goods-producing firms, hereafter "service" firms, are in the right panel. To the extent that import competition in firms' major business segment is the sole determinant of their exposure to PNTR, the points in this figure would be clustered along the 45 degree line. Instead, we find a broad cloud of points, potentially reflecting underlying heterogeneity in other forms of exposure to PNTR. For example, some firms within an industry subject to the same degree of import competition might be better able to take advantage of freer trade with China, or may be located in labor markets with lower average exposure to Chinese imports.

3 Validity

In this section we establish the validity of our approach by demonstrating that AAR_i^{PNTR} is correlated with the standard measure of exposure to PNTR, known as the NTR gap, as well as with firms' abnormal returns during two other important events in US-China relations: the accidental US bombing of China's embassy in Belgrade in 1999 and Donald Trump's surprise election to President in 2016.

3.1 AAR_j^{PNTR} vs the NTR Gap

Existing research on PNTR measures industries' exposure to the change in trade policy in terms of the "NTR gap", defined as the difference between the higher non-NTR rate to which tariffs would have risen if annual renewal had failed, and the often much lower NTR rate permitted under temporary NTR status,

$$NTR\,Gap_i^{Own} = Non - NTR\,Rate_i - NTR\,Rate_i. \tag{4}$$

In this equation, i indexes six-digit NAICS industries and the superscript refers to the fact that this measure represents industry i's "own" exposure.[18] These gaps are computed for 1999, the year before the change in policy, using data on US tariff rates reported in Feenstra et al. (2002).[19] Their mean and standard deviation are 0.27 and 0.17, and we summarize their distribution visually in Figure 5.

[18] Below, we consider firms' exposure to PNTR via up- and downstream linkages.

[19] Tariff rates are assigned according to 8-digit Harmonized System (HS) commodity codes. Following Pierce and Schott (2016b), we take the average NTR gap across HS codes within each 6-digit NAICS code,

Consistent with the idea that annually renewable NTR status prior to PNTR inhibited US-China integration, Pierce and Schott (2016a) show that US manufacturing industries with higher NTR gaps exhibit the largest relative declines in employment after 2000. We present a simple demonstration of this result in the left panel of Figure 6, which divides US manufacturing industries into two groups according to whether their NTR gaps lie above or below the median across all industries.[20] As indicated in the figure, employment for the two groups of industries behaves similarly prior to 2000. After 2000, however, the decline for industries with above-median NTR gaps is more precipitous.

The right panel of Figure 6 is similar, but instead uses the industry-level PNTR average abnormal returns (AAR_i^{PNTR}) estimated in the previous section to split industries into two groups. As noted in the figure, AAR_i^{PNTR} is similarly predictive of differential industry outcomes after, but not before, the change in policy. This outcome suggests AAR_j^{PNTR} captures at least part of the information contained in the NTR gap.

As noted above, we observe firms' worldwide sales in up to ten business segments. We investigate the relationship between firm's AAR_j^{PNTR} and the sales-weighted average NTR gap of their major segments ($NTR\,Gap_j$) using an OLS specification of the form

$$AAR_j^e = \alpha NTR\,Gap_j + X_j\beta + \epsilon_{ji}. \tag{5}$$

$NTR\,Gap_j$ is not defined for service firms; for diversified firms, we substitute a gap of zero for any service segments when computing the sales weighted average. X_j represents a series of firm attributes, including firm size (employment), physical capital per worker, return on assets and a dummy variable for "leading" firms proposed by Gutierrez and Philippon (2017) which indicates whether a firm's market value is in the upper tertile of firms whose largest segment is in the same 4-digit NAICS industry.[21] All variables used in the estimation are de-meaned and divided by their standard deviation so that estimated coefficients indicate the implied standard-deviation impact on the dependent variable of a one standard deviation change in the independent variable. Standard errors are clustered at the four-digit NAICS level and reported in parenthesis below coefficient estimates. The regression sample is restricted to firms with sales in at least one goods-producing industry.

As indicated in the first five columns of the Table 1, we find negative and statistically significant relationships between $NTRGap_j$ and average abnormal returns for each legislative event (AAR_j^e) except the introduction of the bill in the House of Representatives. Column

using the concordance reported in Pierce and Schott (2012).

[20] The manufacturing employment data used to construct this figure are from the NBER-CES manufacturing industry database (Bartelsman et al. (2000)), available on the NBER website.

[21] Firm attributes are for 2000 and are drawn from COMPUSTAT. As is common in studies utilizing COMPUSTAT data, the accounting data are winsorized at the 1 percent level to reduce the influence of outliers; i.e., observations below the first percentile and above the ninety-ninth percentile are replaced with the observations at those percentiles.

6 reveals that this relationship also holds for the average abnormal return across all five events (AAR_j^{PNTR}). The coefficient estimate in that column implies that the relationship is economically as well as statistically significant: a one standard deviation increase in the NTR gap is associated with a -0.223 standard deviation decline in AAR_j^{PNTR}, which represents a drop in market value of 6 percent, or about 177 million dollars.[22]

In Table 1 we examine the relationship between AAR_j^{PNTR} and the NTR gap in the presence of the firm attributes noted above. As indicated in the table, the relationship drops in magnitude but remains negative and statistically significant. Among the added firm attributes, we find positive and statistically significant relationships for three out of the four. That is, AAR_j^{PNTR} rises with firm size, physical capital per worker and return on assets. To the extent that these attributes are correlated with firms' innate efficiency, these relationships are consistent with models predicting that firms with greater productivity might be better able to take advantage of the offshoring opportunities related to PNTR (Antràs et al. (2017); Bernard et al. (2018)).

Finally, Table 3 examines the link between firms' AAR_j^{PNTR} and US import growth from China before and after PNTR in the firm's largest segment. As indicated the first two columns, we find a negative and statistically significant relationship with respect to post-PNTR imports and no relationship with respect to pre-PNTR imports. The latter suggests equity markets correctly anticipated an increase in import competition as a result of PNTR, while the former indicates a lack of prior trend. Column 3 reveals that these relationships are robust to inclusion of the firm attributes noted above. Interestingly, in contrast to the results in Table 3, physical capital per worker retains a positive sign but loses statistical significance. The coefficient estimate on post-2000 import growth from China in the final column, -0.082, indicates that a 1 standard deviation increase in subsequent imports from China is associated with a drop in market value of about 2 percent.

3.2 PNTR and the Belgrade Bombing

As discussed in more detail in Pierce and Schott (2016a), several events in US-China relations during the 1990s likely increased uncertainty regarding annual renewal of China's NTR status in the United States. One of the more prominent of these events was the accidental NATO bombing of the Chinese embassy in Belgrade, Yugoslavia on May, 7 1999. The bombing occurred during an 11-week NATO campaign intending to end Serbian aggression against ethnic Albanians in Kosovo, and was recognized at the time as a potential threat to China's entry into the WTO. For example, three days after the bombing, the Wall Street Journal noted that "prospects for a speedy end to negotiations on China's accession to the World

[22]The average market value of a firm in 2000 in our sample is 3 billion dollars. Multiplying the coefficient of -0.223 by the standard deviation of AAR 1.06 percent) yields a reduction in market value of about 6 percent over 25 days.

Trade Organization just got a lot worse."[23] Given the proximity of the bombing to the passage of PNTR, we examine how firms' average abnormal returns in the seven trading after it occured, $AAR_j^{Bombing}$, compare to AAR_j^{PNTR}.[24] A virtue of this external validity check, relative to the results reported in Table 1, is that we are able to investigate responses for both goods-producing and service firms.

Our first step is to investigate via OLS the link between $AAR_i^{Bombing}$ and the NTR gap,

$$AAR_j^{Belgrade} = \alpha NTR\,Gap_j + X_j\beta + \epsilon_i, \tag{6}$$

where X_j continues to represent firm attributes in 2000 and, as above, all variables have been de-meaned and divided by their standard deviations.Results, reported in Table 4, indicate that firms' NTR gaps exhibit a *positive* relationship with $AAR_j^{Belgrade}$, both in a simple bivariate regression and when the additional controls are included, though statistical significance is only found for the former. These positive relationships are consistent with the idea that firms that receive greater protection from pre-PNTR US trade policy towards China might benefit from a breakdown in US-China relations due to the bombing, e.g., if protests in China prompt the US Congress to reject China's temporary NTR status. The negative relationship between $AAR_j^{Belgrade}$ and firm attributes in column 2 suggests such a breakdown may be relatively more costly for more capital-intensive and higher-ROA firms.

In Table 5, we analyze the association between returns after the bombing and AAR_j^{PNTR}, also via OLS,

$$AAR_j^{PNTR} = \alpha AAR_j^{Belgrade} + X_j\beta + \epsilon_i. \tag{7}$$

The sample for this regression includes both goods-producing and service firms, and we report results both with and without the inclusion of firm attributes. We find that α is *negative* and generally statistically significant in all cases, indicating that firms that might benefit in relative terms from a potential breakdown of US-China relations due to the bombing might be harmed in relative terms from the trade liberalization. Interestingly, the magnitude and statistical significance of α is greater for service firms.

3.3 PNTR and the 2016 Presidential Election

During his campaign for President, Donald Trump emphasized his intent to overturn what he perceived to be "bad deals" in international trade, particularly those with respect to China and the North American Free Trade Agreement.[25] As a consequence, his surprise

[23] https://www.wsj.com/articles/SB926284661489396187.

[24] We employ a longer event window for studying the bombing given that information about it unfolded slowly.

[25] For example, in a 2016 campaign rally in Staten Island, Trump stated, "China's upset because of the way Donald Trump is talking about trade with China. They're ripping us off, folks, it's time. I'm so happy

victory offers another opportunity to examine the external validity of AAR_j^{PNTR}. Here, however, we conduct the analysis at the industry level, given the degree of firm attrition and industry-switching that occurs between 2000 and 2016. We compare the market capitalization weighted average AAR_j^{PNTR} across firms' major industries, AAR_i^{PNTR}, to similarly constructed returns in the seven days[26] following the election, AAR_i^{Trump}, using an OLS specification of the form

$$AAR_i^{Trump} = \alpha AAR_i^{PNTR} + X_i\beta + \epsilon_i. \tag{8}$$

As above, i indexes 6-digit NAICS industries, all variables are de-meaned and divided by their standard deviations, and standard errors are clustered at the four-digit NAICS level. All specifications include the full set of controls appearing in Table 1.[27]

Results, reported in Table 6, are consistent with the idea that industries whose expected profits might rise with PNTR are those whose profits might fall with Trump's election. That is, we find a negative and statistically significant relationship between AAR_i^{PNTR} and AAR_i^{Trump}, where the coefficient estimate in the first column implies that a one standard deviation increase in AAR_i^{PNTR} is associated with a 0.16 standard deviation decrease in AAR_i^{Trump}. Results in the second column reveal that this relationship is robust to the inclusion of industry-level controls, while those in columns 3 and 4 show that it holds among both goods and services industries.

4 AAR_j^{PNTR} and Continuing-Firm Outcomes

The NTR gap measures exposure to import competition. AAR_j^{PNTR}, by contrast, captures traders' assessment of the net impact of all avenues of exposure, of which there might be many. For example, the decline in expected tariffs on Chinese goods may prompt some US firms to locate part of their production process in China. Depending on the effect of this relocation on firms' costs, and the extent to which it is conducted within the boundaries of the firm, it might raise or lower firms' domestic and worldwide employment, as discussed

they're upset." Similarly, when discussing NAFTA, Trump stated, "NAFTA is the worst trade deal maybe ever signed anywhere, but certainly ever signed in this country." Wagner et al. (2018) shows that firms' abnormal returns in the days surrounding Donald Trump's election are negatively correlated with their exposure to international markets, and that more internationally exposed sectors exhibit declines relative to more domestically oriented sectors.

[26] We choose this window to reflect the unexpected nature of his election and uncertainty over how he might react in the first few days after election. At the beginning of the Trump campaign in 2015, betting markets were offering 25:1 odds against his success. These odds never became shorter than 5:1, even on the day before the election (http://fortune.com/2016/11/09/donald-trump-president-gamble/).

[27] These attributes are for 2000 and are drawn from COMPUSTAT. They represent market capitalization weighted averages of each attribute across firms within each six-digit NAICS industry. As before, all accounting ratios derived from COMPUSTAT are winsorized at the 1 percent level.

in the theoretical models of Antràs et al. (2017) and Bernard et al. (2018). A similar mechanism might operate among purely domestic firms, which, as a result of the change in trade policy, might have greater access to lower-cost suppliers of inputs previously produced or sourced domestically. Greater import competition from China may also prompt some firms to increase investment in process or product innovations, boosting physical, human or intangible capital. To the extent that these innovations lower production costs or increase demand, they may also result in higher sales and employment.

In this section we investigate the relative explanatory power of firms' PNTR average abnormal returns *vis a vis* the NTR gap in explaining various firm outcomes that have appeared in the literature.

4.1 Baseline Specification

Our baseline specification is a firm-level OLS difference-in-differences regression,

$$\begin{aligned} ln(Outcome_{jt}) &= \delta Post \times AAR_j^{PNTR} + Post \times \mathbf{X_j}\beta \\ &\quad + \alpha_j + \alpha_t + \epsilon_{jt}. \end{aligned} \tag{9}$$

The sample period is 1990 to 2006, where the endpoint is chosen to avoid the onset of the Great Recession. The left-hand side variable represents one of several firm outcomes available in COMPUSTAT: employment, sales, markup (sales divided by the cost of goods sold), physical capital, intangible capital and total assets. We note that we *do not* observe firms' US employment: rather, in COMPUSTAT, firm employment represents a firm's *total* employment across all divisions and locations around the world. Likewise, sales encompasses total revenue globally. Physical capital is defined as property, plant, and equipment. Intangible capital is a quantity available in COMPUSTAT that is meant to capture firms' investments in both "knowledge capital" and "organizational capital". As discussed in greater detail in Peters and Taylor (2017), it is the sum of firms' externally purchased and internally created intangible assets, which includes items such as goodwill from firms' balance sheets and capitalized spending on knowledge, patents, software and brand from their income statements. Finally, total assets is the sum of the firms' assets from their balance sheets.

The first term on the right-hand side of equation 9 is the difference-in-differences term of interest – an interaction of firms' average abnormal return and an indicator variable (*Post*) for years after 2000 – which captures the relative change in outcomes among firms with differential exposure to the change in policy after versus before it occurs. The second term on the right-hand side represents a series of initial (1990) firm attributes that proxy for investment opportunities and firms' ability to finance future investments, also interacted with *Post*. These attributes are the market-to-book value of assets (i.e., Tobin's q), operating

cash flows divided by total assets (i.e., return on assets), log of total assets (i.e., size), book leverage (the book value of debt divided by total assets), and cash holdings divided by total assets.[28]

The final terms on the right-hand side of equation 9 are the firm and year fixed effects required to identify the difference-in-differences coefficient. Firm fixed effects capture the impact of any time-invariant firm characteristics, while year fixed effects account for aggregate shocks that affect all firms equally. Regressions are weighted by the initial value of the dependent variable and, as in previous regressions, initial firm attributes from COMPUSTAT are winsorized at the 1 percent level and standardized. Standard errors are clustered by 4-digit NAICS industry.NBER_Tables/PrePost_EMP_dvarwgtd_cln4_fmtd

Employment: Results for firms' total world employment are reported in Table 7. The first column presents estimates for all firms. As indicated in the table, we find a positive and statistically significant relationship between abnormal returns and log employment, indicating that firms with higher AAR_j^{PNTR} exhibit a relative increase in employment after the change in policy versus before. The coefficient estimate, 0.119, implies that a one standard deviation increase inAAR_j^{PNTR} is associated with a relative increase in employment of 0.119 log points in the post period.

As noted above, an attractive feature of using average abnormal returns to assess exposure to PNTR is the ability to analyze firms outside goods-producing industries, i.e., those in service industries for which an $NTR\,Gap_i^{Own}$ is not defined because their output does not exist in the US tariff schedule. Toward that end, we estimate equation 9 separately for both goods-producing and service firms. As indicated in columns 2 and 3, we find positive and statistically significant relationships in both cases, with the coefficient for services higher in magnitude, 0.134 versus 0.118 for goods-producing firms. These estimates indicate that a one standard deviation increase in AAR_j^{PNTR} is associated with relative increases in employment of 0.118 and 0.134 log points, respectively, after the change in policy.[29]

The next three columns of Table 7 examine the relative predictive power of AAR_j^{PNTR} and the NTR gap.[30] Column 4 introduces $NTR\,Gap_i^{Own}$, and includes only firms for which this measure is defined. Column 5 also focuses on goods-producing firms, adding the diagonal-excluding up- and downstream NTR gaps noted above, $NTR\,Gap_i^{Up3}$ and $NTR\,Gap_i^{Down3}$. Column 6 concentrates on service firms, for which $NTR\,Gap_i^{Own}$ is not defined. For these firms we include only $NTR\,Gap_i^{Up3}$ and $NTR\,Gap_i^{Down3}$.

The estimates in these columns have several noteworthy trends. First, we find that AAR_j^{PNTR} remains positive and statistically significant in all three specifications, with mag-

[28]For firms that enter the sample after 1990, we use their attributes upon entry in constructing $\mathbf{X_j}$.

[29]

[30]In Appendix Table A.1, we report similar regressions omitting AAR_j^{PNTR}. In those results, we find that $NTR\,Gap_i^{Own}$, has the expected sign and is statistically significant at conventional levels in the majority of specifications

nitudes that are largely unchanged relative to columns 2 and 3. Second, we find that while the estimates for $NTR\,Gap_i^{Own}$ have the expected negative sign in each specification, they are not statistically significant at conventional levels. Together, these two trends suggest that our proposed measure incorporates all of the information contained in the standard measure of exposure to PNTR used in the literature, and, indeed, has explanatory power beyond it. As such, they provide further support for the assumptions underlying our event-study approach. Similarly, we find that $NTR\,Gap_i^{Up3}$ and $NTR\,Gap_i^{Down3}$ are generally not statistically significant at conventional levels. The lone exception – the downstream effect among service firms – exhibits the expected sign, as greater exposure downstream may reduce demand, thereby dampening employment.

In the final three columns of the table, we re-estimate columns 4 through 6 and introduce two-digit NAICS sector-by-year fixed effects. Inclusion of these fixed effects mitigates the concern that employment growth in the years following PNTR was driven by sector-level shifts – for instance, due to changes in the real estate sector prior to the housing crisis – and that growing sectors coincidentally responded positively to PNTR legislation. By including these fixed effects, we are exploiting variation across firms within a given sector in a given year. Perhaps unsurprisingly, the magnitudes of the point estimates in these specifications are reduced slightly, but AAR_j^{PNTR} remains statistically significant in all three specifications.

Comparison with the literature: We provide context for the results in Table 7 by comparing them to others in the literature, and to estimates from our data based solely on the NTR gap. Pierce and Schott (2016a), whose analysis is closest to that performed here, find that a one-standard deviation increase in an establishment's NTR gap (computed as the value weighted average gap across its products) is associated with a relative decline in employment of approximately 0.053 log points. While this estimate is smaller in magnitude than our estimate for AAR_j^{PNTR} reported in Table 7 for goods-producing firms, this could be due to the difference in the sample of firms used in this analysis. Specifically, the data used in Pierce and Schott (2016a) focus solely on establishments' US manufacturing employment. The employment data in COMPUSTAT, by contrast, are at the *firm* level and include workers both outside the United States and in divisions outside manufacturing. To address this difference directly, we re-estimate this table solely using the NTR gapin our sample of firms and omit firm-level AAR_j^{PNTR} in Appendix Table A.1. Here we find that a one standard deviation decrease in $NTR\,Gap_i^{Own}$ is associated with a relative increase in employment of 0.066 log points, about half of the magnitude reported in Table 7. Notably, however, this point estimate is strikingly similar to the effect document in Pierce and Schott (2016a). This suggests that the difference in the estimated effect of PNTR via AAR_j^{PNTR} and the NTR gap is not driven by our sample of publicly traded firms.

Other Outcomes: To conserve space, we report results for the other outcomes we examine visually, in Figure 9. Each panel of the figure reports results for a different outcome, with the first panel duplicating the results for employment that appear in Table 7. Within each

panel, each line reports the 95 percent confidence interval for the difference-in-differences terms of interest from the specifications reported in columns 1 to 3, 5, 6, 8, and 9 from Table 7. Results for other specifications and variables are suppressed but available upon request.

As indicated in the second panel of the figure, results for sales are similar to those for employment. That is, we find that the interactions of AAR_j^{PNTR} and the *Post* indicator variable are positive and statistically significant across all firms as well as across goods-producing and service firms, with coefficients of similar magnitude as in the employment regressions. The point estimate for all firms, 0.167, implies that implies that a firm whose AAR_j^{PNTR} is one standard deviation above the mean exhibits a relative increase in sales of 0.167 log points in the post period. As with employment, relatively greater sales growth among firms with higher AAR_j^{PNTR} may indicate a relative expansion of domestic or foreign demand driven by PNTR's impact on firm costs. Results for the remaining specifications indicate that these estimates are robust to inclusion of the NTR gap terms as well as 2-digit NAICS by year fixed effects.

The third panel of Figure 9 investigates the relationship between PNTR and a coarse measure of firm profitability, the ratio of sales to cost of goods sold. As indicated in the figure, estimates are positive and statistically significant at conventional levels among goods producing firms, but negative and statistically significant among service firms. These results suggest, implicitly, that firm sales relative to costs rise among goods-producing firms, while the opposite is true for service firms.

The bottom three panels of Figure 9 report estimates for physical capital, intangible capital, and total assets. We find positive coefficients among both goods and service firms in both cases, though results for intangible capital are only marginally statistically significant. These results suggest firms may engage in product or process upgrading in response to import competition, consistent with existing research on US and European firms by Bernard et al. (2006), Khandelwal (2010), Bernard et al. (2011) and Bloom et al. (2016).[31]

4.2 Annual Specifications

If changes in firm outcomes are actually attributable to PNTR, abnormal returns should be correlated with firm outcomes after passage of PNTR, but not before. To determine whether there is a relationship between AAR_j^{PNTR} and outcomes in the years prior to 2001, we replace the single difference-in-differences term in equation (9) with interactions between AAR_j^{PNTR} and a full set of year dummies. We also include the interaction of firms' initial

[31] Autor et al. (2016) find that increases in Chinese import penetration negatively affects US manufacturers' innovative activities. Examining US manufacturing establishments, Pierce and Schott (2017) find that investment among continuers with greater exposure to PNTR via the NTR gap exhibits relative declines after the change in policy, those these declines are relatively moderate for establishments with relatively high levels of initial labor productivity, skill intensity and capital intensity. Gutierrez and Philippon (2017) document relative increases in investment and innovation among industry leaders in response to PNTR.

(1990) attributes and year dummies,

$$ln(Outcome_{jt}) = \sum_{t=1990}^{2006} \delta_t \times AAR_j + \sum_{y=1990}^{2006} \times \mathbf{X_j}\beta_\mathbf{t} + \alpha_j + \alpha_t + \epsilon_{jt}. \quad (10)$$

In all other respects, the estimation of equation 10 resembles that of equation 9.

To conserve space, we focus on specifications including all firms (i.e., analogous to column 1 of Table 7) and present results visually in Figure 8. Each panel of the figure focuses on a different outcome, and within each panel a series of 95 percent confidence intervals traces out the sequence of δ_y from 1990 to 2006, with 2000 being the omitted year.

The first panel of the figure examines employment. Consistent with the requirements of difference-in-differences identification, we find that estimates of δ_t are close to zero and are not statistically significant at conventional levels prior to 2000. In years following the policy change, however, point estimates are positive and statistically significant, with coefficients rising to about 0.15. We find a similar pattern of results for sales, physical capital, intangible capital and total assets, in panels 2, 4, 5, and 6. Consistent with the "post" difference-in-differences results in Table 7, estimates of δ_t are statistically insignificant both before and after 2000 for the ratio of sales to cost of goods sold, suggesting that firm costs rose in tandem with sales.

5 Firm Exit

Finally, we explore the likelihood of firm exit in response to PNTR. Exit from the CRSP dataset signifies a de-listing from the firm's stock exchange, which may occur for one of five reasons: bankruptcy or liquidation, merger, firm contraction (e.g., firm assets, equity, or capital fall below levels required to be listed), a listing violation (e.g., due to a corporate governance problem, or an insufficient number of shareholders or market makers), and "other". Table 8 provides a more detailed breakdown of the CRSP de-listing codes.[32]

We examine the relationship between PNTR CARs and exit using a firm-level multinomial logit regression,

$$Pr(Y_j = d) = \beta AAR_j^{PNTR} + \overrightarrow{\gamma} X_{ji}^{2000} + \epsilon_j, \quad (11)$$

where $Pr(Y_j = d)$ is the probability that firm j exits between 2000 and 2006 due to one of the five de-listing events noted above, indexed by d. The base outcome is survival. As with

[32] As noted in the appendix, the number of firms exiting due to these causes is 144, 1615, 467, 404, and 205, respectively.

our previous firm-level regressions, we include controls for initial (in this case, year 2000) firm attributes, X_j^{2000}, standardize all variables by subtracting their mean and dividing by their standard deviations, and winsorize all accounting variables at the 1 percent level.

Results are reported in Table 9, which includes the full set of coefficients as well as the marginal effect of firms' AAR_j^{PNTR}, evaluated at the mean for all covariates, for each outcome. As indicated in the table, exposure to PNTR has a negative and statistically significantly relationship with the likelihood of exit via three channels: bankruptcy, de-listing due to contraction, and listing violations. The marginal effects indicate that a one standard deviation increase in AAR_j^{PNTR} is associated with a relative increase in the probability of exiting due to bankruptcy (column 3), contraction (column 4), or listing violations (column 5) of 0.4, 1.3 and 0.6 percent. These estimates are also economically significant, given that the unconditional probabilities of exit due to bankruptcy, contraction, and listing violations are 2, 8, and 7 percent. The probability of exit via merger or miscellaneous reasons respond weakly to PNTR exposure, if at all.

6 Conclusion

In this paper we introduce a new method for measuring firm exposure to trade liberalization based on equity market responses that capture traders' assessment of the net impact of all avenues of exposure and provide estimates for firms both within and outside goods-producing industries. We use this method to investigate firm sensitivity to the United States' granting of Permanent Normal Trade Relations to China in October, 2000, and find that firms' average abnormal returns during key legislative milestones associated with this liberalization vary widely within industries, that they are correlated with standard variables used to assess import competition, and that they provide explanatory power beyond these standard measures in explaining subsequent firm outcomes.

Further exploration of this approach is warranted. For example, assessing firm exposure to non-tariff barriers is notoriously difficult, as changes in these barriers can be hard to express in terms of equivalent increases or decreases in tariff rates (Goldberg and Pavcnik (2016)). Our approach may also prove useful for evaluating firm sensitivity to other shocks, such as or changes in technology, to the extent that they can be associated with discrete events. We are currently exploring applications along these lines.

References

Acemoglu, D., D. Autor, D. Dorn, G. H. Hanson, and B. Price (2016). Import Competition and the Great U.S. Employment Sag of the 2000s. *Journal of Labor Economics 34*(S1), S141–S198.

Amiti, M. and J. Konings (2007). Trade Liberalization, Intermediate Inputs, and Productivity: Evidence from Indonesia. *American Economic Review 97*(5), 1611–1638.

Antràs, P., T. C. Fort, and F. Tintelnot (2017). The margins of global sourcing: Theory and evidence from u.s. firms. *American Economic Review 107*(9), 2514–64.

Autor, D., D. Dorn, G. H. Hanson, G. Pisano, and P. Shu (2016, December). Foreign competition and domestic innovation: Evidence from u.s. patents. Working Paper 22879, National Bureau of Economic Research.

Autor, D., D. Dorn, G. H. Hanson, G. Pisano, and P. Shu (2017). Foreign Competition and Domestic Innovation: Evidence from U.S. Patents. *NBER Working Paper #22879*.

Autor, D., D. Dorn, G. H. Hanson, and J. Song (2014). Trade adjustment: Worker-level evidence. *The Quarterly Journal of Economics 129*, 199–1860.

Autor, D. H., D. Dorn, and G. H. Hanson (2013). The china syndrome: Local labor market effects of import competition in the united states. *American Economic Review 103*(6), 2121–68.

Bartelsman, E. J., R. A. Becker, and W. B. Gray (2000). NBER-CES manufacturing industry database.

Bernard, A. B., J. B. Jensen, S. Redding, and P. Schott (2011). Multi-product firms and trade liberalization. *Quarterly Journal of Economics 126*(3), 1271–1318.

Bernard, A. B., J. B. Jensen, S. J. Redding, and P. K. Schott (2018, June). Global firms. *Journal of Economic Literature 56*(2), 565–619.

Bernard, A. B., J. B. Jensen, and P. K. Schott (2006). Survival of the best fit: Exposure to low-wage countries and the (uneven) growth of us manufacturing plants. *Journal of International Economics*.

Bloom, N., M. Draca, and J. V. Reenen (2016). Trade induced technical change: The impact of chinese imports on innovation, diffusion, and productivity. *Review of Economic Studies 83*, 87–117.

Bloom, N., M. Draca, and J. Van Reenen (2016). Trade Induced Technical Change? The Impact of Chinese Imports on Innovation, IT, and Productivity. *Review of Economic Studies* (83), 87–117.

Breinlich, H. (2011). Heterogenous Firm-Level Responses to Trade Liberalization: A Test Using Stock Price Reactions. *Journal of International Economics 2014*(93), 270–285.

Bustos, P. (2011). Trade liberalization, exports and technology upgrading: Evidence on the impact of mercosur on argentinian firms. *American Economic Review 101*(1), 304–340.

Dix-Carneiro, R. (2014). Trade Liberalization and Labor Market Dynamics. *Econometrica 82*(3), 825–885.

Fama, E. F., L. Fisher, M. C. Jensen, and R. Roll (1969). The Adjustment of Stock Prices to New Information. *International Economic Review 10*.

Feenstra, R. C., H. Ma, and Y. Xu (2017). US Exports and Employment. *NBER Working Paper No. 24056*.

Feenstra, R. C., J. Romalis, and P. K. Schott (2002). Us imports, exports, and tariff data, 1989-2001. Working Paper 9387, National Bureau of Economic Research.

Feenstra, R. C. and A. Sasahara (2017). The "China Shock," Exports and U.S. Employment: A Global Input-Output Analysis. *NBER Working Paper No. 24022*.

Fernandes, A. M. (2007). Trade Policy, Trade Volumes, and Plant-Level Productivity in Columbian Manufacturing Industries. *Journal of International Economics 71*(1).

Golberg, P. K., A. K. Khandelwal, N. Pavcnik, and P. Topalova (2010). Imported Intermediate Inputs and Domestic Productivity Growth: Evidence From India. *Quarterly Journal of Economics 125*(4), 1727–1767.

Goldberg, P. K. and N. Pavcnik (2016). The effects of trade policy. mineo.

Gutierrez, G. and T. Philippon (2017, July). Declining competition and investment in the u.s. Working Paper 23583, National Bureau of Economic Research.

Gutierrez, G. and T. Phillipon (2017). Declining Competition and Investment in the U.S.

Hakobyan, S. and J. McLaren (2016). Looking for Local Labor Market Effects of NAFTA. *The Review of Economics and Statistics 98*(4), 728–741.

Handley, K. and N. Limão (2017). Policy Uncertainty, Trade, and Welfare: Theory and Evidence for China and the U.S. *American Economic Review 107*(9), 2731–83.

Huang, Y., C. Lin, S. Liu, and T. Heiwai (2018). Trade Linkages and Firm Value: Evidence from the 2018 U.S.-China "Trade War". *working paper*.

Khandelwal, A. (2010). The long and short (of) quality ladders. *Review of Economic Studies 77*, 1450–1476.

Khotari, S. and J. B. Warner (2006). Econometrics of Event Studies. *Handbook of Corporate Finance: Empirical Corporate Finance A*(1).

Kogan, L., D. Papanikolau, A. Seru, and N. Stoffman (2017). Technological Innovation, Resource Allocation, and Growth. *Quarterly Journal of Economics 132*(2).

Mobarak, A. M. and D. P. Purbasari (2006). Protection for Sale To Firms: Evidence from Indonesia. *Yale mimeo*.

Mosder, C. and A. Rose (2014). Who Benefits from Regional Trade Agreements? The View from the Stock Market. *European Economic Review 68*, 31–47.

Peters, R. H. and L. A. Taylor (2017). Intangible Capital and The Investment-q Relation. *Journal of Financial Economics 123*(2), 251–272.

Pierce, J. R. and P. K. Schott (2012). A concordance between ten-digit u.s. harmonized system codes and sic/naics product classes and industries. *Journal of Economic and Social Measurement 37*, 61–96.

Pierce, J. R. and P. K. Schott (2016a). The Surprisingly Swift Decline of U.S. Manufacturing Employment. *American Economic Review 106*(7), 1632–1662.

Pierce, J. R. and P. K. Schott (2016b). The Surprisingly Swift Decline of U.S. Manufacturing Employment. *American Economic Review 106*(7), 1632–1662.

Pierce, J. R. and P. K. Schott (2017). Investment responses to trade liberalization: Evidence from u.s. industries and establishments. *NBER Working Papers #24017*.

Sharpe, W. F. (1964). Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk.

Topalova, P. (2010). Factor Immobility and Regional Impacts of Trade Liberalization: Evidence on Poverty from India. *American Economic Journal: Applied Economics 2*(4), 1–41.

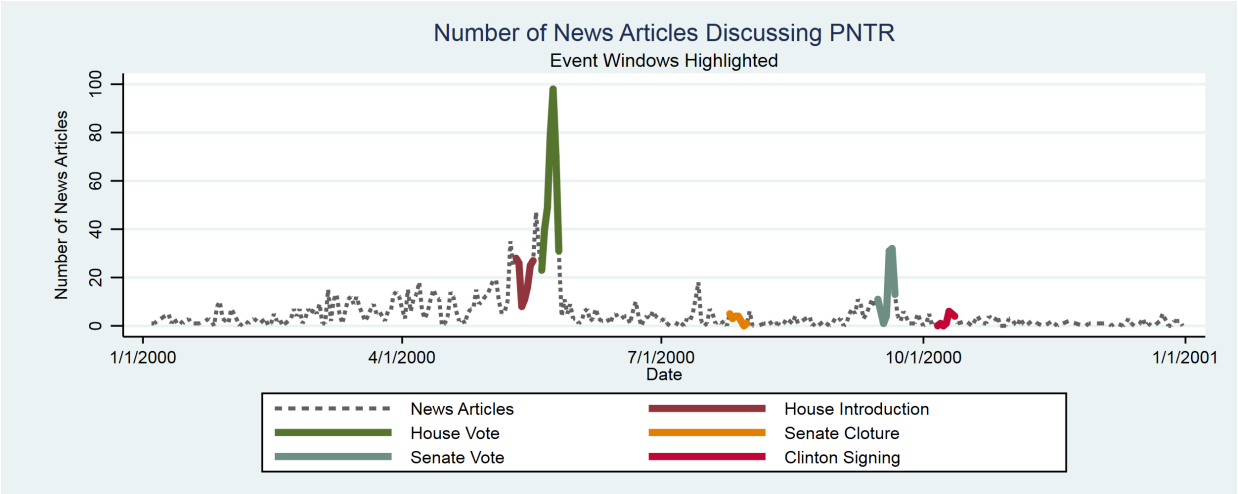
Topalova, P. and A. K. Khandelwal (2011). Trade Liberalization and Firm Productivity: The Case of India. *The Review of Economics and Statistics 93*(3), 995–1009.

Wagner, A. F., R. J. Zeckhauser, and A. Ziegler (2018). Company Stock Price Reactions to the 2016 Election: Trump, Taxes, and Trade. *Journal of Financial Economics* Forthcoming.

Wang, Z., S.-J. Wei, X. Yu, and K. Zhu (2018). Re-examining the Impact of the China Trade Shock on US Labor Market: A Value Chain Perspective. *Working Paper*.

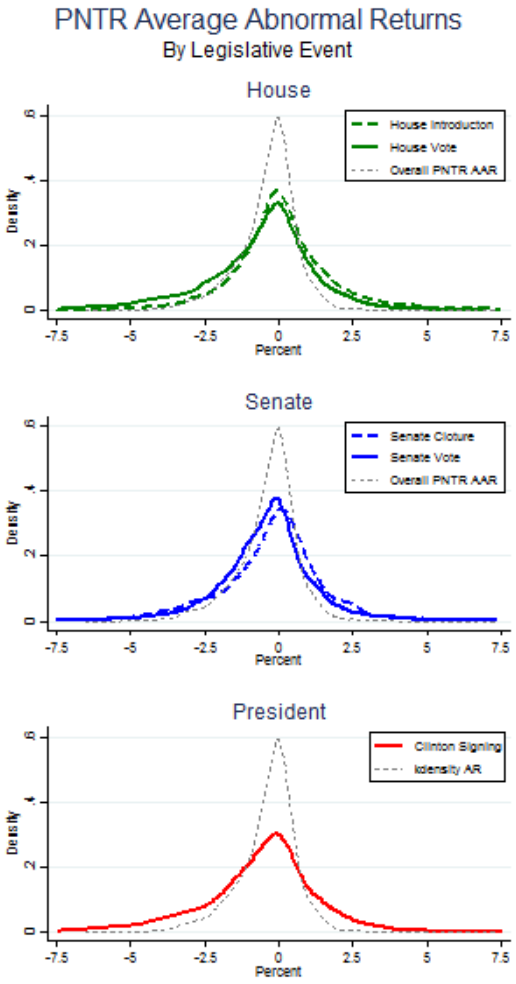
Wolfers, J. and E. Zitzewitz (2018). What Can We Learn From Financial Market Response to the 2016 Election? The Standard Error of Event Studies: Lessons from the 2016 Election. *AEA Papers and Proceedings 108*, 584–589.

Figure 1: Count of Articles Mentioning "Permanent Normal Trade Relations"



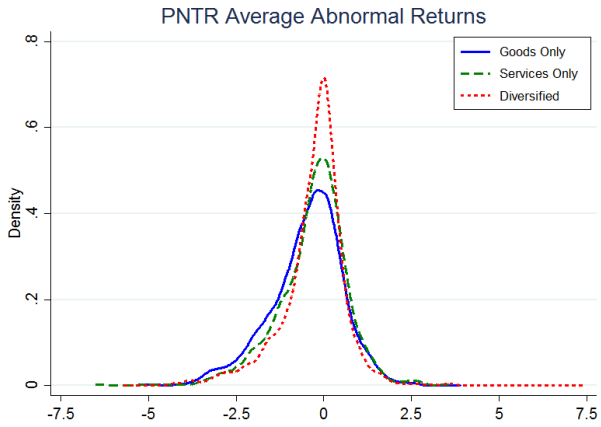
Source: Noted media outlets and authors' calculations. Figure reports the number of unique articles which mention PNTR during calendar year 2000 from the following sources: the Associated Press, BBC Monitoring Inernational Reports, the Boston Globe, the Chicago Tribune, CNN Transcripts, the Financial Times, the Los Angeles Times, the New York Times, the Washington Post, PR Newswire and the the Wall Street Journal. The five bold segments of the time series indicate the five legislative event windows considered in our analysis: the introduction of the bill in the House , the House vote, the Senate vote to bring the bill to the floor, the Senate vote and Clinton's signing, in that order.

Figure 2: PNTR Average Abnormal Returns, By Event



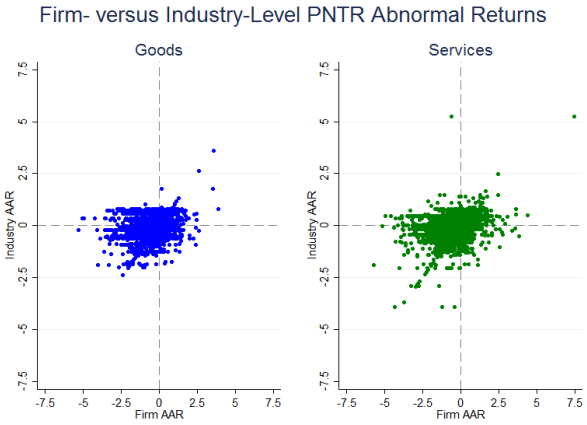
Source: CRSP and authors' calculations. Figure displays distributions of AAR_j across 5 PNTR legislative events and overall. Values below -7.5 and above 7.5 percent are dropped to improve readability.

Figure 3: PNTR Average Abnormal Returns, By Type of Firm



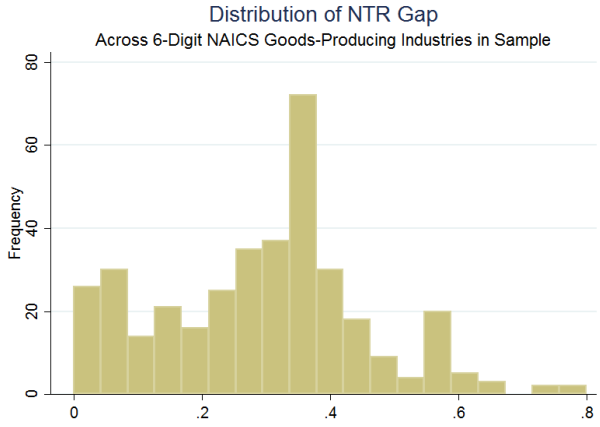
Source: CRSP and authors' calculations. Figure plots distribution of AAR_j^{PNTR} for three mutually exclusive firm types: those which only produce goods, those which only produce services, and those which produce both. Values below -7.5 and above 7.5 percent are dropped to improve readability. The means and standard deviations for the three groups of firms are -0.48 and 1.06 percent, -0.28 and 1.01 percent, and -0.30 and 1.02 percent, respectively.

Figure 4: Firm- versus Industry-Level Average Abnormal Returns



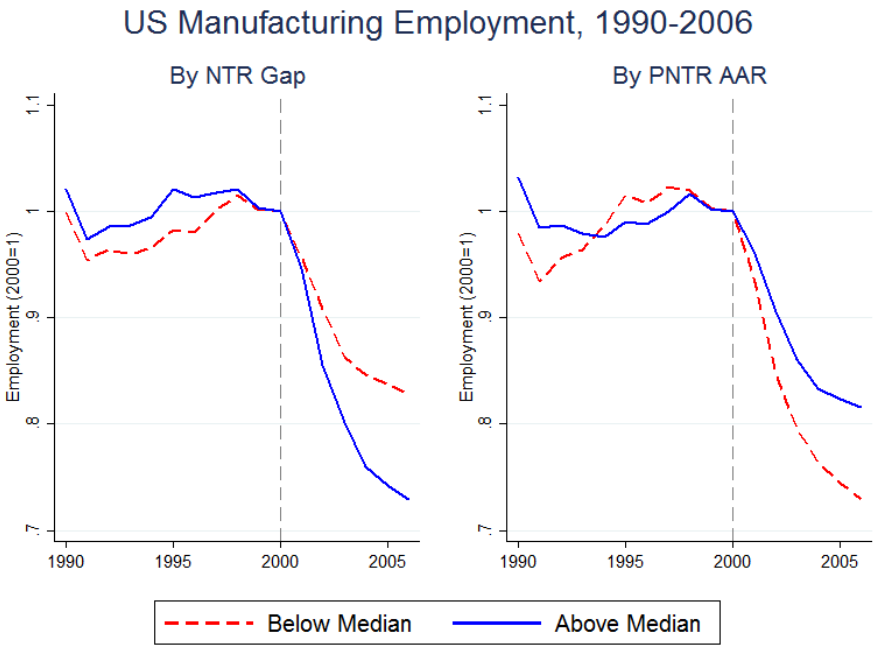
Source: CRSP and authors' calculations. Figure compares firms' AAR_j^{PNTR} to the market-capitalization weighted average AAR_j^{PNTR} of their major 6-digit NAICS industry . Values below -7.5 and above 7.5 percent are dropped to improve readability. The means and standard deviations for the three groups of firms are -0.48 and 1.06 percent, -0.28 and 1.01 percent, and -0.30 and 1.02 percent, respectively.

Figure 5: Distribution of the NTR Gap



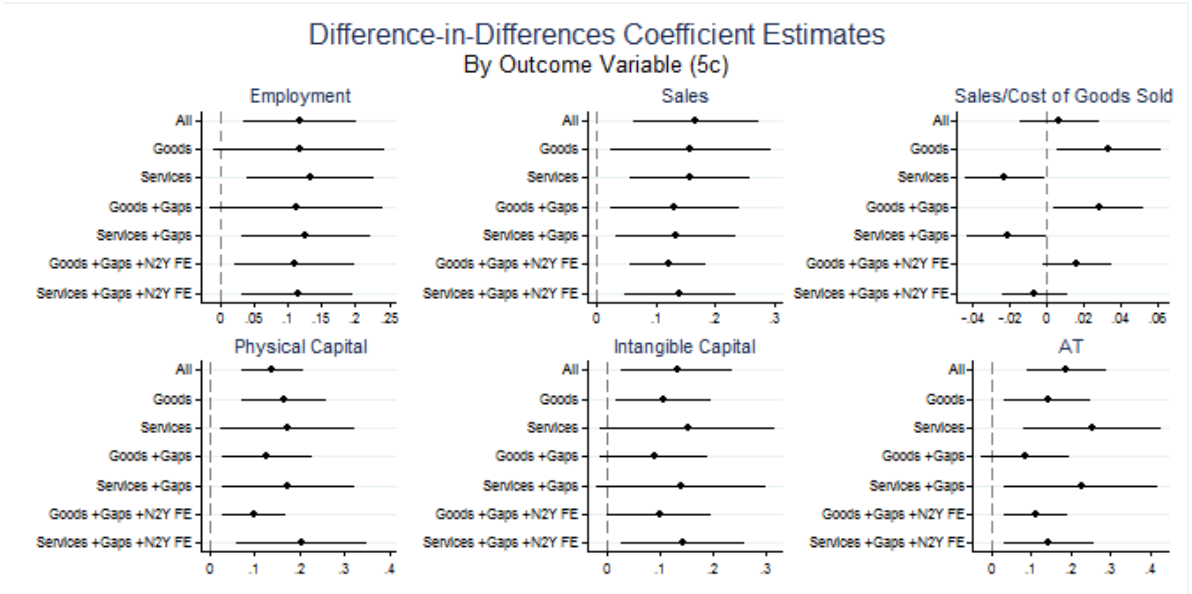
Source: Feenstra et al. (2002). Figure displays the distribution of $NTR\,Gap_i^{Own}$ across goods-producing 6-digit manufacturing industries populated by firms our sample. Goods-producing sectors are defined as: Manufacturing (NAICS 31-33), Mining (NAICS 21), and Agriculture, Forestry, Fishing and Hunting (NAICS 11).

Figure 6: US Manufacturing Employment by $NTR\,Gap_i^{Own}$ versus AAR_i^{PNTR}



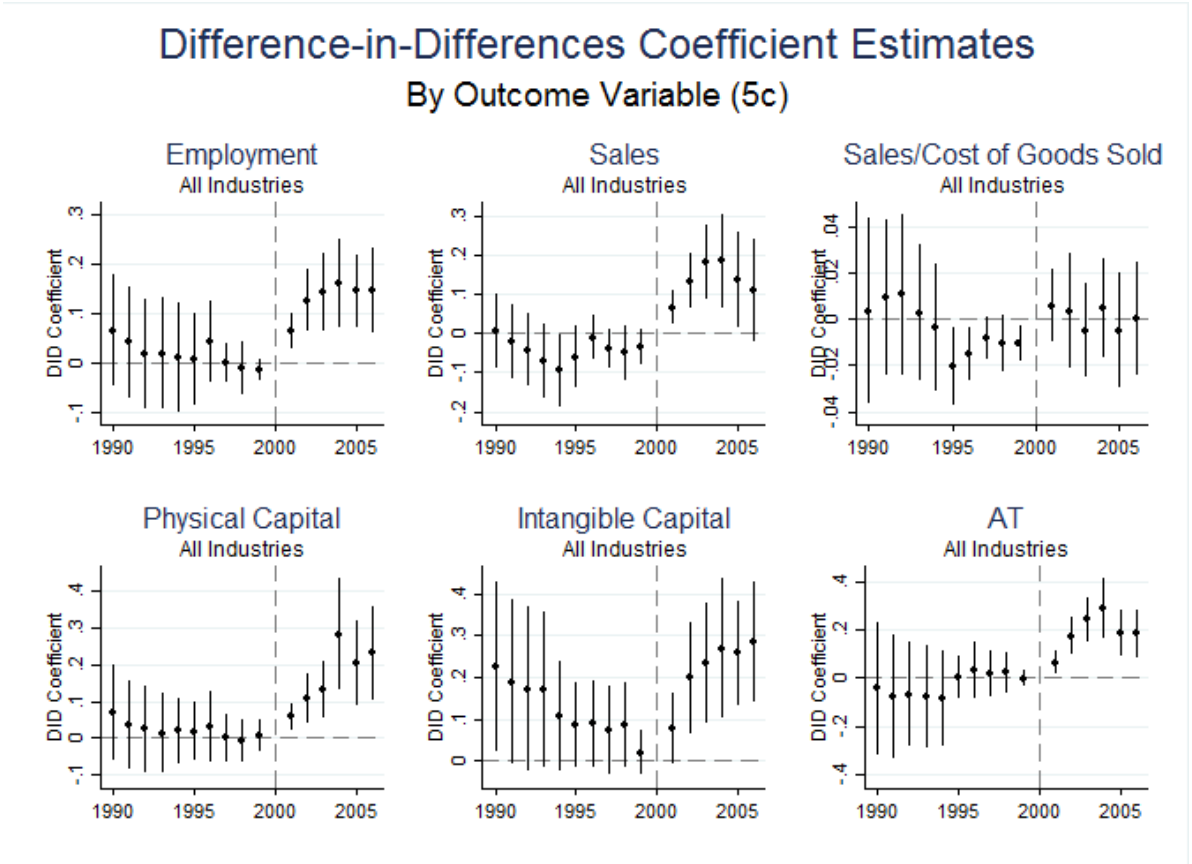
Source: NBER-CES Manufacturing Industry Database, CRSP and authors' calculations. Figure displays the evolution of US manufacturing employment from 1990 to 2006 according to two different groupings of 6-digit NAICS industries. In the left panel, industries are separated according to whether their $NTR\,Gap_i^{Own}$ are above or below the median across all industries. In the right panel, industries are grouped according to whether their AAR_i^{PNTR} lie above or below the median.

Figure 7: AAR and Firm Outcomes (Post Specification)



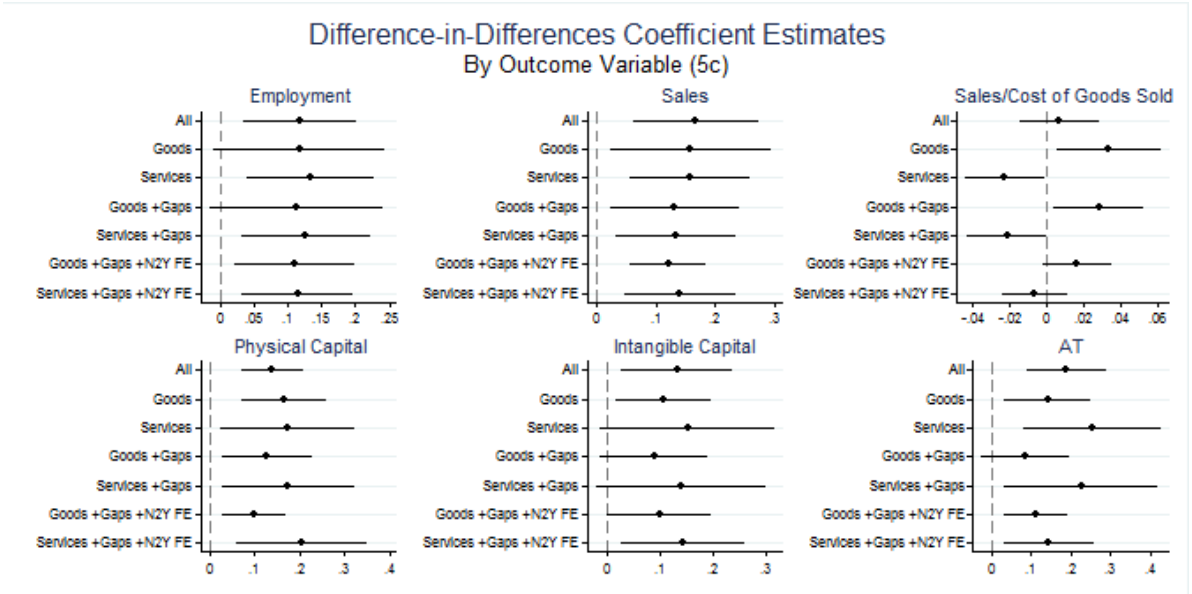
Source: CRSP, COMPUSTAT and authors' calculations. Figure displays results of firm-level OLS panel regressions of noted firm outcomes on firms' PNTR average abnormal returns (AAR_j^{PNTR}) interacted with an indicator variable for years after 2000 ($Post$) and a series of initial (1990) firm characteristics also interacted with $Post$. Coefficients and standard errors for all right-hand side varaibles other than the difference-in-differences terms of interest are suppressed. Each 95 percent confidence interval comes from a seperate regression. There are seven results for each outome, corresponding to the specifications reported in columns 1 to 3, 6, 7, 10 and 11 from Table 7. Confidence intervals 1 to 3 in each panel report baseline results for all firms, goods-producing firms and service firms, respectively. Confidence intervals 4 and 5 also include $NTRGap_i^{Own}$, $NTRGap_i^{Up}$ and $NTRGap_i^{Down}$ as additional right-hand side variables. Confidance intervals 6 and 7 also include 2-digit NAICS by year fixed effects. Sample period is 1990 to 2006. Initial firm attributes are market capitalization, market to book value of equity, return on assets, and growth in total capital. Right-hand side variables also include firm and year fixed effects. All variables have been have been normalized by dividing them by their standard deviations, and winsorized at the 1 percent level. Regressions are weighted by the initial (1990) value of the dependent variable. Standard errors used to construct confidence intervals are clustered at the NAICS 4-digit level. Note that y-axis scales vary across panels.

Figure 8: AAR and Firm Outcomes (Annual Specification)



Source: CRSP, COMPUTSTAT and authors' calculations. Figure displays results of firm-level OLS panel regressions of noted firm outcomes on firms' PNTR average abnormal returns (AAR_i^{PNTR}) interacted with a full set of year dummy variables and a series of initial firm characteristics also interacted with year dummies. Coefficients and standard errors for all right-hand side varaibles other than the difference-in-differences terms of interest are suppressed. Each 95 percent confidence interval comes from a seperate regression. There are two results for each outome, representing estimation on firms in goods-producing and service firms, respectively. Sample period is 1990 to 2006. Initial firm attributes are are market capitalization, market to book value of equity, return on assets, and growth in total capital. Right-hand side variables also include firm and year fixed effects. All variables have been have been normalized by dividing them by their standard deviations and all accounting ratios have been winsorized at the 1 percent level. Regressions are weighted by the initial (1990) value of the dependent variable. Standard errors used to construct confidence intervals are clustered at the NAICS 4-digit level.

Figure 9: AAR and Firm Outcomes (Post Specification)



Source: CRSP, COMPUSTAT and authors' calculations. Figure displays results of firm-level OLS panel regressions of noted firm outcomes on firms' PNTR average abnormal returns (AAR_j^{PNTR}) interacted with an indicator variable for years after 2000 ($Post$) and a series of initial (1990) firm characteristics also interacted with $Post$. Coefficients and standard errors for all right-hand side varaibles other than the difference-in-differences terms of interest are suppressed. Each 95 percent confidence interval comes from a seperate regression. There are seven results for each outome, corresponding to the specifications reported in columns 1 to 3, 6, 7, 10 and 11 from Table 7. Confidence intervals 1 to 3 in each panel report baseline results for all firms, goods-producing firms and service firms, respectively. Confidence intervals 4 and 5 also include $NTRGap_i^{Own}$, $NTRGap_i^{Up}$ and $NTRGap_i^{Down}$ as additional right-hand side variables. Confidance intervals 6 and 7 also include 2-digit NAICS by year fixed effects. Sample period is 1990 to 2006. Initial firm attributes are market capitalization, market to book value of equity, return on assets, and growth in total capital. Right-hand side variables also include firm and year fixed effects. All variables have been have been normalized by dividing them by their standard deviations, and winsorized at the 1 percent level. Regressions are weighted by the initial (1990) value of the dependent variable. Standard errors used to construct confidence intervals are clustered at the NAICS 4-digit level. Note that y-axis scales vary across panels.

Table 1: AAR_j^{PNTR} versus the NTR Gap and Firm Attributes

	(1) House Intro	(2) House Vote	(3) Sentate Intro	(4) Senate Vote	(5) Clinton Sign	(6) Overall
NTR Gap	0.007	-0.164***	-0.158***	-0.045**	-0.188***	-0.223***
	(0.035)	(0.042)	(0.027)	(0.021)	(0.044)	(0.050)
Constant	0.094***	-0.115**	-0.086**	-0.027	-0.038	-0.075
	(0.032)	(0.053)	(0.039)	(0.024)	(0.041)	(0.051)
Observations	2640	2640	2640	2640	2640	2640
R^2	0.000	0.025	0.025	0.002	0.032	0.050

Source: CRSP and authors' calculations. This table presents firm-level OLS regressions of average abnormal returns during key PNTR legislatove milestones on the NTR Gap. The regression sample is restricted to firms in goods-producing industries. All variables are de-meaned and divided by their standard deviation. Accounting variables are winsorized at the 1 percent level. Standard errors are reported below coefficient estimates and are clustered by 4-digit NAICS industries. *, ** and *** indicate statistical significance at the 10, 5 and 1 percent levels, respectively.

Table 2: AAR_j^{PNTR} versus the NTR Gap and Firm Attributes

	(1) AAR^{PNTR}	(2) AAR^{PNTR}	(3) AAR^{PNTR}	(4) AAR^{PNTR}	(5) AAR^{PNTR}
NTR Gap	-0.224***	-0.202***	-0.167***	-0.132***	-0.132***
	(0.052)	(0.053)	(0.039)	(0.031)	(0.031)
Ln(Size)		0.199***	0.178***	0.095***	0.094**
		(0.039)	(0.043)	(0.036)	(0.038)
PPE per Worker			0.098	0.105*	0.105*
			(0.060)	(0.054)	(0.054)
Return on Assets				0.230***	0.230***
				(0.022)	(0.022)
GP (2017) Leader Firm					0.021
					(0.065)
Constant	-0.071	-0.085	-0.097*	-0.082**	-0.083**
	(0.052)	(0.057)	(0.052)	(0.041)	(0.041)
Observations	2615	2615	2615	2615	2615
R^2	0.049	0.089	0.095	0.149	0.149

Source: CRSP and authors' calculations. This table presents firm-level OLS regressions of AAR_j^{PNTR} on the NTR Gap and firm attributes. Firm attributes are for 2000. The regression sample is restricted to firms in goods-producing industries. All variables are de-meaned and divided by their standard deviation. Accounting variables are winsorized at the 1 percent level. Standard errors are reported below coefficient estimates and are clustered by 4-digit NAICS industries. *, ** and *** indicate statistical significance at the 10, 5 and 1 percent levels, respectively.

Table 3: AAR_j^{PNTR} versus Chinese Import Growth

	(1) AAR^{PNTR}	(2) AAR^{PNTR}	(3) AAR^{PNTR}
Δ ln(Imports 2000-6)	-0.088**	-0.088**	-0.082**
	(0.044)	(0.043)	(0.036)
Δ ln(Imports 1991-00)		-0.000	-0.015
		(0.042)	(0.040)
Ln(Size)			0.089***
			(0.025)
PPE per Worker			0.048
			(0.036)
Return on Assets			0.228***
			(0.031)
GP (2017) Leader Firm			0.136
			(0.084)
Constant	-0.084	-0.084	-0.102**
	(0.055)	(0.055)	(0.048)
Observations	1882	1882	1882
R^2	0.008	0.008	0.098

Source: CRSP and authors' calculations. This table presents firm-level OLS regressions of AAR_j^{PNTR} on US import growth from China in the firm's major industry and firm attributes. Firm attributes are for 2000. The regression sample is restricted to firms in industries for which imports are observed. All variables are de-meaned and divided by their standard deviation. Accounting variables are winsorized at the 1 percent level. Standard errors are reported below coefficient estimates and are clustered by 4-digit NAICS industries. *, ** and *** indicate statistical significance at the 10, 5 and 1 percent levels, respectively.

Table 4: $AAR_j^{Belgrade}$ versus the NTR Gap

	(1) $\text{AAR}^{Belgrade}$	(2) $\text{AAR}^{Belgrade}$
NTR Gap	0.095**	0.051
	(0.038)	(0.034)
Ln(Size)		0.030
		(0.037)
PPE per Worker		-0.051*
		(0.028)
Return on Assets		-0.109***
		(0.025)
GP (2017) Leader Firm		-0.359***
		(0.075)
Constant	0.048	0.073**
	(0.037)	(0.032)
Observations	2488	2488
R^2	0.007	0.024

Source: CRSP and authors' calculations. This table presents firm-level OLS regressions of $AAR_j^{Belgrade}$ on the NTR Gap. Firm attributes are for 2000. "Goods" and "Service" refer to firms producing only NAICS 1 to 3 and only NAICS 4 to 9, respectively. All variables are de-meaned and divided by their standard deviation. Accounting variables are winsorized at the 1 percent level. Standard errors are reported below coefficient estimates and are clustered by 4-digit NAICS industries. *, ** and *** indicate statistical significance at the 10, 5 and 1 percent levels, respectively.

Table 5: AAR_j^{PNTR} versus $AAR_j^{Belgrade}$

	(1) AAR^{PNTR}	(2) AAR^{PNTR}	(3) AAR^{PNTR}	(4) AAR^{PNTR}	(5) AAR^{PNTR}	(6) AAR^{PNTR}
$AAR^{Belgrade}$	-0.069***	-0.052**	-0.105**	-0.036*	-0.013	-0.083*
	(0.020)	(0.021)	(0.046)	(0.021)	(0.023)	(0.046)
Ln(Size)				0.097***	0.081**	0.119***
				(0.026)	(0.034)	(0.038)
PPE per Worker				0.084*	0.163***	0.010
				(0.050)	(0.061)	(0.043)
Return on Assets				0.265***	0.258***	0.262***
				(0.023)	(0.025)	(0.052)
GP (2017) Leader Firm				0.058	0.068	0.003
				(0.061)	(0.069)	(0.097)
Constant	-0.034	-0.069	0.022	-0.044	-0.095**	0.008
	(0.055)	(0.074)	(0.063)	(0.042)	(0.048)	(0.061)
Observations	4119	2557	1562	4119	2557	1562
R^2	0.005	0.003	0.008	0.112	0.142	0.084
Firm Type	All	Goods	Services	All	Goods	Services

Source: CRSP and authors' calculations. This table presents firm-level OLS regressions of AAR_j^{PNTR} on $AAR_j^{Belgrade}$ and a series of firm attributes. Firm attributes are for 2000. "Goods" and "Service" refer to firms producing only NAICS 1 to 3 and only NAICS 4 to 9, respectively. All variables are de-meaned and divided by their standard deviation. Accounting variables are winsorized at the 1 percent level. Standard errors are reported below coefficient estimates and are clustered by 4-digit NAICS industries. *, ** and *** indicate statistical significance at the 10, 5 and 1 percent levels, respectively.

Table 6: PNTR AAR versus 2016 Presidential Election AAR

	AAR^{Trump}			
	(1) All	(2) All	(3) Goods	(4) Services
AAR^{PNTR}	-0.160**	-0.177**	-0.233*	-0.162*
	(0.0598)	(0.0648)	(0.103)	(0.0826)
Ln(Size)		-0.138	-0.302***	0.0348
		(0.114)	(0.0221)	(0.167)
$\frac{Equity_{Market}}{Equity_{Book}}$		-0.0753	-0.109	0.0247
		(0.0624)	(0.0769)	(0.0757)
ROA		0.268***	0.374**	0.238***
		(0.0754)	(0.157)	(0.0657)
%Δ Investment		0.134**	0.278***	0.0298
		(0.0589)	(0.0786)	(0.0505)
Constant	0.0128	0.0302	0.0615	0.00372
	(0.0958)	(0.116)	(0.132)	(0.121)
Observations	377	371	203	168
R-squared	0.026	0.076	0.175	0.046

Source: CRSP and authors' calculations. Table presents 6-digit-NAICS-level OLS estimates from regressing average abnormal returns surrounding the 2016 Presidential election (AAR_i^{TRUMP}) on average abnormal returns during key legislative events associated with PNTR (AAR_i^{PNTR}) and a series of year-2000 industry-level control variables that are standard in the asset pricing literature: market capitalization, market to book value of equity, return on assets, and growth in total capital. In each case, these controls represent market-capitalization weighted averages across the firms in each industry. All variables have been have been normalized by dividing them by their standard deviations. Accounting ratios have been winsorized at the 1 percent level. Standard errors are clustered at the NAICS 4-digit level and are reported below coefficient estimates. *, ** and *** indicate statistical significance at the 10, 5 and 1 percent levels, respectively.

Online Appendix (Not for Publication)

This online appendix contains additional empirical results noted in the main text.

Table 7: AAR and Firm Employment (Baseline Specification)

	Ln(Employment)								
	(1) All	(2) Goods	(3) Services	(4) Goods	(5) Goods	(6) Services	(7) Goods	(8) Goods	(9) Services
AAR^{PNTR}	0.119***	0.118*	0.134***	0.116*	0.113*	0.127***	0.119***	0.111**	0.115***
× Post	(0.0422)	(0.0638)	(0.0477)	(0.0630)	(0.0647)	(0.0476)	(0.0423)	(0.0449)	(0.0418)
NTR Gap^{Own}				-0.0431	-0.0485		-0.0667**	-0.0702**	
× Post				(0.0309)	(0.0348)		(0.0318)	(0.0332)	
NTR Gap^{Up^3}					0.0186	-0.0571		0.0206	-0.0501
× Post					(0.0378)	(0.0582)		(0.0320)	(0.0540)
NTR Gap^{Down^3}					-0.0162	-0.115**		-0.0368	-0.113
× Post					(0.0332)	(0.0456)		(0.0239)	(0.0764)
Tobins Q	0.138*	-0.139	0.212***	-0.118	-0.106	0.216***	0.149	0.164*	0.206***
× Post	(0.0765)	(0.180)	(0.0750)	(0.176)	(0.174)	(0.0791)	(0.0915)	(0.0924)	(0.0689)
$\frac{CashFlows}{Assets}$	0.171***	0.163**	0.188***	0.167**	0.170**	0.243***	0.125**	0.124**	0.236**
× Post	(0.0412)	(0.0659)	(0.0706)	(0.0646)	(0.0676)	(0.0794)	(0.0581)	(0.0598)	(0.0974)
Ln(Size)	-0.113***	-0.103**	-0.114***	-0.107***	-0.109***	-0.119***	-0.102***	-0.109***	-0.129***
× Post	(0.0319)	(0.0398)	(0.0425)	(0.0402)	(0.0365)	(0.0404)	(0.0301)	(0.0310)	(0.0390)
Book Leverage	0.0350	-0.0673	0.0786**	-0.0716	-0.0770	0.0765**	-0.0610	-0.0693	0.0426
× Post	(0.0387)	(0.0697)	(0.0353)	(0.0698)	(0.0692)	(0.0375)	(0.0465)	(0.0462)	(0.0310)
$\frac{Cash}{Assets}$	-0.0397	0.0177	-0.0660	0.0285	0.0249	-0.103	-0.0156	-0.0241	-0.0273
× Post	(0.0455)	(0.0999)	(0.0512)	(0.101)	(0.102)	(0.0629)	(0.0698)	(0.0740)	(0.0766)
Constant	10.64***	10.24***	10.94***	10.24***	10.24***	10.97***	10.13***	10.12***	11.67***
	(0.0395)	(0.0421)	(0.0501)	(0.0427)	(0.0429)	(0.0489)	(0.142)	(0.140)	(1.749)
Year-FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NAICS -2 × Year - FE	No	No	No	No	No	No	Yes	Yes	Yes
N	49612	28480	21132	28480	28480	20425	28480	28480	20425
R^2	0.045	0.034	0.112	0.036	0.037	0.123	0.231	0.234	0.310

Source: CRSP, COMPUSTAT and authors' calculations. Table presents firm-level OLS panel regressions of noted firm outcomes on firms' PNTR average abnormal returns (AAR_j^{PNTR}) and a series of initial firm characteristics. All right-hand side variables have been multiplied by a dummy variable indicating years after 2000, i.e., $Post \times AAR_j^{PNTR}$ is displayed as AAR_j^{PNTR}. Sample period is 1990 to 2006. Initial firm attributes are are market capitalization, market to book value of equity, return on assets, and growth in total capital. Right-hand side variables also include firm and year fixed effects. All variables have been have been normalized by dividing them by their standard deviations, and accounting variables have been winsorized at the 1 percent level. Regressions are weighted by the initial (1990) value of the dependent variable. Standard errors are clustered at the NAICS 4-digit level and are reported below coefficient estimates. *, ** and *** indicate statistical significance at the 10, 5 and 1 percent levels, respectively.

Table 8: CRSP De-Listing Codes

Delist Code	Frequency	Code Description
Merger		
231-233	1423	When merged shareholders receive stock, ADR's, or cash.
241-261	192	When merged, shareholders receive other compensation
Bankruptcy or Liquidation		
450-470	10	Issue Liquidated.
574	137	Bankruptcy, declared insolvent.
Firm Contraction		
552	281	Price fell below acceptable level.
560	112	Insufficient capital, surplus, and/or equity.
561	74	Insufficient (or non-compliance with rules of) float or assets.
Listing Violation		
550	3	Insufficient number of market makers.
551	16	Insufficient number of shareholders.
580-587	385	Violation of listing requirements including corporate governance violations
Other De-listing		
500	1	Issue stopped trading on exchange - reason unavailable.
520	99	Issue stopped trading current exchange - trading Over-the-Counter
570,573,575	245	De-listed by current exchange - company request.

Source: CRSP and authors' calculations. Table presents presents the CRSP de-listing codes used for categorizing the firm exits between 2000 and 2006 among the firms for which we are able to calculate AAR_j^{PNTR}.

Table 9: AAR and Firm Exit

	Survival	Merger	Bankruptcy	Firm Contraction	Listing Violation	Other De-listing
	Marginal Effect at Mean of Covariates					
	0.0143	0.00825	-0.00367*	-0.0130***	-0.00606**	0.000235
	(0.00976)	(0.00760)	(0.00211)	(0.00309)	(0.00281)	(0.00158)
Unconditional Probability	0.58	0.21	0.02	0.08	0.07	0.03
%Δ in Probability	0.02	0.04	-0.15	-0.15	-0.08	-0.007
	Multinomial Logit Coefficients					
AAR^{PNTR}		0.0131	-0.245*	-0.328***	-0.170**	-0.00967
		(0.0457)	(0.140)	(0.0704)	(0.0728)	(0.0898)
Tobins Q		-0.0927	-1.138*	0.348***	0.373***	-0.374
		(0.122)	(0.584)	(0.103)	(0.100)	(0.339)
$\frac{CashFlows}{Assets}$		0.0454	-0.556***	-0.563***	-0.481***	-0.333***
		(0.0558)	(0.116)	(0.0852)	(0.100)	(0.106)
Ln(Size)		-0.288***	-0.332**	-1.441***	-1.459***	-1.330***
		(0.0497)	(0.130)	(0.118)	(0.106)	(0.165)
Book Leverage		0.0641	0.657***	0.366***	0.328***	0.119
		(0.0549)	(0.0995)	(0.0966)	(0.0668)	(0.110)
$\frac{Cash}{Assets}$		0.0981	-0.354**	-0.0922	-0.0291	-0.106
		(0.0822)	(0.156)	(0.101)	(0.113)	(0.202)
Constant		-1.015***	-3.831***	-2.662***	-2.686***	-3.536***
		(0.0803)	(0.276)	(0.110)	(0.140)	(0.192)

Source: CRSP and authors' calculations. Table presents results of firm-level multinomial logit model of exit during the 2000 to 2006 sample period. Potential reasons for exit are listed in Table 8. The base outcome (column 1) is survival through the end of 2006. Firms exiting due to equity exchange (i.e., a particular security is retired and replaced with another for the same firm) are omitted from the analysis. Right-hand side variables include initial (year 2000) market capitalization, market to book value of equity, return on assets, and growth in total capital. All variables have been have been normalized by dividing them by their standard deviations, and accounting controls have been winsorized at the 1 percent level. Standard errors are clustered at the NAICS 4-digit level and are reported below coefficient estimates. *, ** and *** indicate statistical significance at the 10, 5 and 1 percent levels, respectively.

Table A.1: NTR Gap and Firm Outcomes (Baseline Specification)

	(1) Ln(Employment)	(2) Ln(Assets)	(3) Ln(PPE)	(4) Ln(Intangibles)	(5) Ln(Sales)	(6) Ln(Markup)	(7) Ln(COGS)
	Panel A: Goods						
NTR Gap^{Own}	-0.0665*	-0.0614*	-0.0857***	0.00902	-0.147***	0.0122	-0.159***
× Post	(0.0341)	(0.0363)	(0.0311)	(0.0298)	(0.0418)	(0.00986)	(0.0438)
N	28480	28859	28790	27926	28535	28516	28295
R^2	0.224	0.471	0.317	0.397	0.378	0.159	0.345
	Panel B: Goods						
NTR Gap^{Own}	-0.0649*	-0.0457	-0.0593**	0.0233	-0.124***	0.0145	-0.138***
× Post	(0.0345)	(0.0337)	(0.0266)	(0.0316)	(0.0333)	(0.0111)	(0.0363)
NTR Gap$^{Up^3}$	0.00388	-0.0704	-0.0767**	-0.0845**	-0.0829**	-0.0112	-0.0719*
× Post	(0.0313)	(0.0448)	(0.0301)	(0.0422)	(0.0379)	(0.0116)	(0.0377)
NTR Gap$^{Down^3}$	-0.0577**	-0.0750**	-0.0440*	-0.0565	-0.0378	-0.0234*	-0.0146
× Post	(0.0254)	(0.0375)	(0.0224)	(0.0448)	(0.0284)	(0.0130)	(0.0282)
	28480	28859	28790	27926	28535	28516	28295
R^2	0.228	0.476	0.323	0.403	0.384	0.163	0.349
	Panel C: Services						
NTR Gap$^{Up^3}$	-0.0444	-0.120*	-0.0333	-0.422***	-0.0454	0.0333**	-0.0768
× Post	(0.0554)	(0.0722)	(0.0371)	(0.132)	(0.0522)	(0.0165)	(0.0602)
NTR Gap$^{Down^3}$	-0.122	-0.0904	-0.0367	-0.0109	0.0145	-0.0155	0.0314
× Post	(0.0749)	(0.122)	(0.103)	(0.134)	(0.0788)	(0.0160)	(0.0849)
N	20425	21027	20625	17864	20954	20938	20893
R^2	0.303	0.519	0.450	0.392	0.291	0.255	0.275

Source: CRSP, COMPUTSTAT and authors' calculations. Table presents firm-level OLS panel regressions of noted firm outcomes on the NTR Gap associated with firms' major industry ((NTR_i^{Own})) and and a series of initial firm characteristics. Sample period is 1990 to 2006. Initial firm attributes are are market capitalization, market to book value of equity, return on assets, and growth in total capital. Right-hand side variables also include firm and year fixed effects. All variables have been have been normalized by dividing them by their standard deviations, and winsorized at the 1 percent level. Regressions are weighted by the initial (1990) value of the dependent variable. Standard errors are clustered at the NAICS 4-digit level and are reported below coefficient estimates. *, ** and *** indicate statistical significance at the 10, 5 and 1 percent levels, respectively.